



ICAO ENGINE nvPM EMISSIONS DATA SHEET

SUBSONIC ENGINES

ENGINE IDENTIFICATION: CF34-3B/-3B1 BYPASS RATIO (-): 6.3
UNIQUE ID NUMBER: 01P05GE189 PRESSURE RATIO π_{co} (-): 19.2
COMBUSTOR: SAC
ENGINE TYPE: TF RATED OUTPUT F_{oo} (kN): 41.0

REGULATORY DATA

CHARACTERISTIC VALUES:	LTO_{mass}/F_{oo} (mg/kN)	LTO_{num}/F_{oo} (particles/kN)	NVPM MASS CONCENTRATION ($\mu\text{g}/\text{m}^3$)
LTO/F_{oo} AND MAX $nvPM_{mass}$	232.8	$3.10\text{E}+15$	7420
AS % OF CAEP/10 LIMIT	-	-	66.4
AS % OF CAEP/11 LIMIT (InP)	6.2	14.0	
AS % OF CAEP/11 LIMIT (NT)	24.1	26.7	

MEASURED DATA

MODE	POWER SETTING (% F_{oo})	TIME minutes	FUEL FLOW kg/s	EMISSIONS INDICES*		NVPM MASS CONCENTRATION PEAK $nvPM_{mass}$ ($\mu\text{g}/\text{m}^3$)
				EI_{mass} (mg/kg)	EI_{num} (particles/kg)	
TAKE-OFF	100	0.7	0.404	208.6	$1.71\text{E}+15$	
CLIMB OUT	85	2.2	0.333	72.4	$1.05\text{E}+15$	
APPROACH	30	4.0	0.121	0.5	$3.79\text{E}+13$	
IDLE	7	26.0	0.048	1.8	$2.07\text{E}+14$	
LTO TOTAL (kg, mg, number of particles)			164	6870	$9.14\text{E}+16$	-
NUMBER OF ENGINES				1	1	1
NUMBER OF TESTS				3	3	3
AVERAGE LTO/F_{oo} VALUES (mg/kN, particles/kN)				167.5	$2.23\text{E}+15$	-
MAX EI VALUES (mg/kg, particles/kg) AND MAX MASS CONC. ($\mu\text{g}/\text{m}^3$)				208.6	$1.71\text{E}+15$	5765

* Emissions Indices are corrected for thermophoretic loss and fuel hydrogen content

DATA FOR EMISSIONS INVENTORIES (ESTIMATIONS FOR ENGINE EXIT PLANE VALUES)

MODE	POWER SETTING (% F_{oo})	CORRECTED EMISSIONS INDICES	
		$EI_{mass,SL}$ (mg/kg)	$EI_{num,SL}$ (particles/kg)
TAKE-OFF	100	255.6	$5.78\text{E}+15$
CLIMB OUT	85	94.0	$4.40\text{E}+15$
APPROACH	30	1.1	$4.75\text{E}+14$
IDLE	7	4.2	$3.14\text{E}+15$

AMBIENT CONDITIONS

	From	To	FUEL	
BAROMETER (kPa)	100.8	101.7	HEAT OF COMBUSTION (MJ/kg)	43.14
TEMPERATURE (K)	280.3	284.1	HYDROGEN CONTENT (%mass)	13.73
HUMIDITY (kg water/kg dry air)	0.0022	0.0028	AROMATICS CONTENT (%vol)	17.2
			NAPHTHALENE CONTENT (%vol)	2.01
			SULPHUR CONTENT (ppm by mass)	721

MANUFACTURER: General Electric Company
TEST ORGANIZATION: General Electric Company
TEST LOCATION: Cell #121
TEST DATES: 15/11/2019

REMARKS

1. GE Aviation Report R2019AE312/Rev. 0
2. Engine S/N 801-588